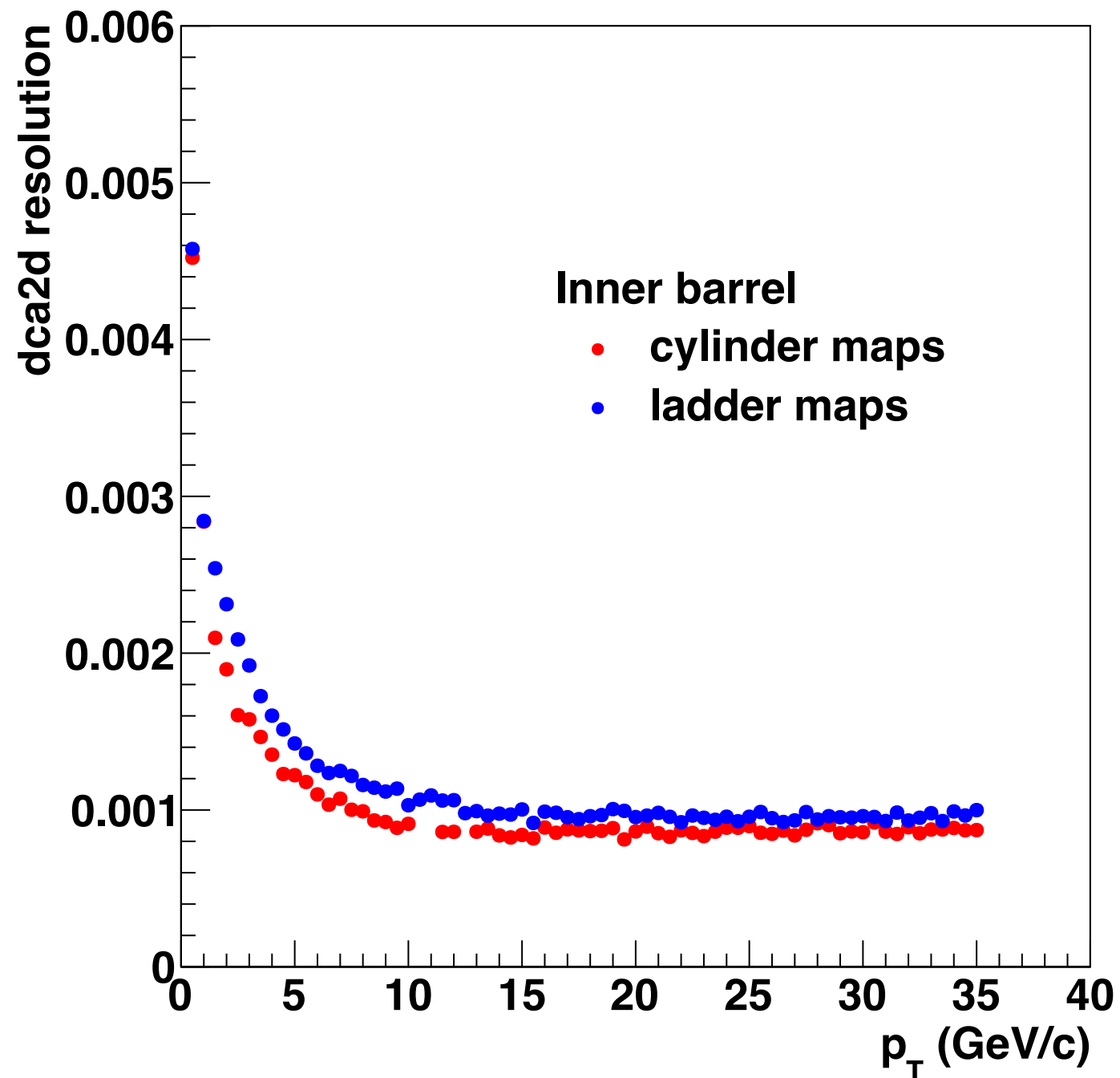


Comparisons of ladder and cylinder geometry for MAPS inner barrel + TPC

Tony Frawley
August 8, 2016

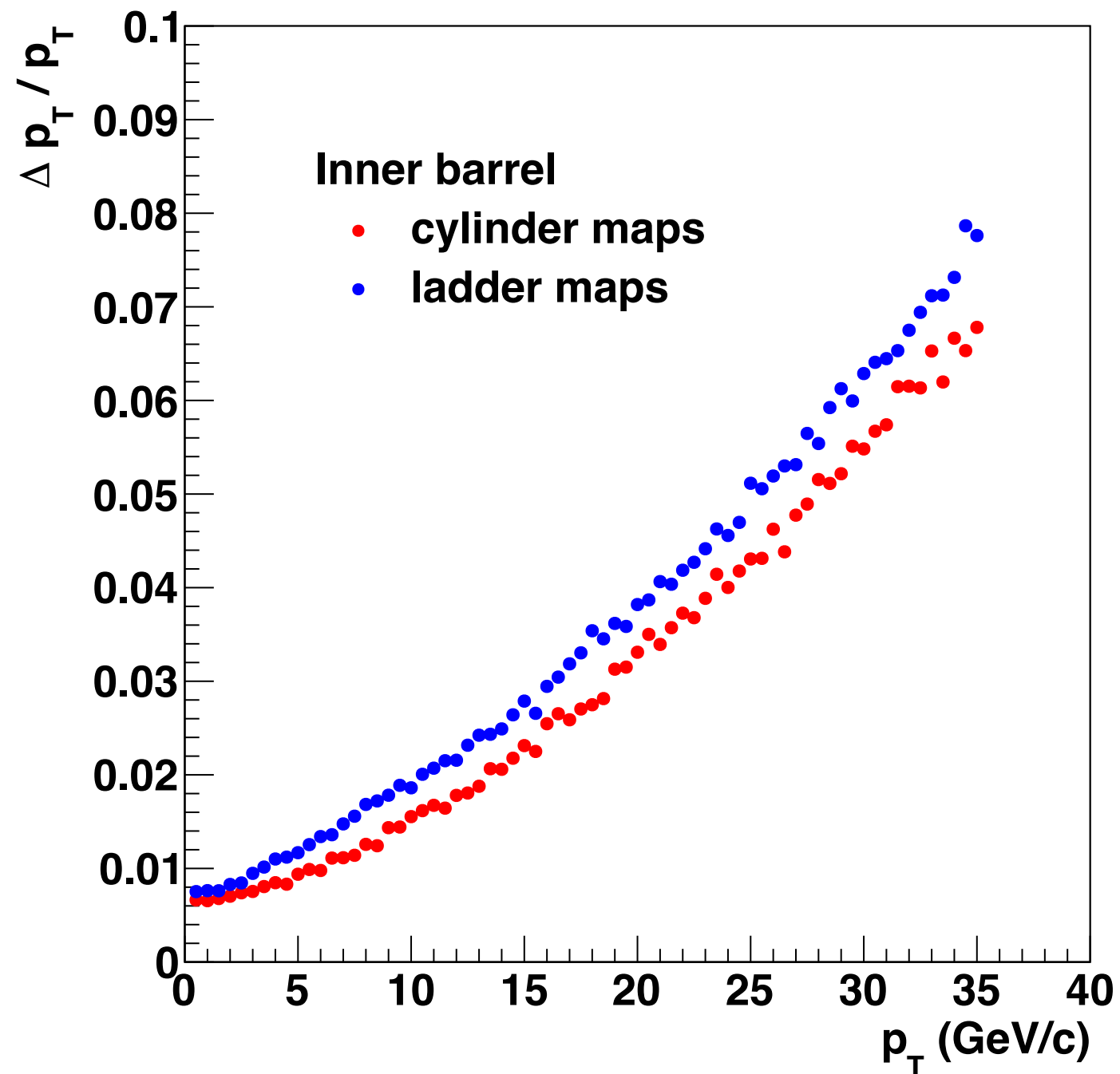
Displaced vertex performance

Embedded 80 pions per central Hijing collision.



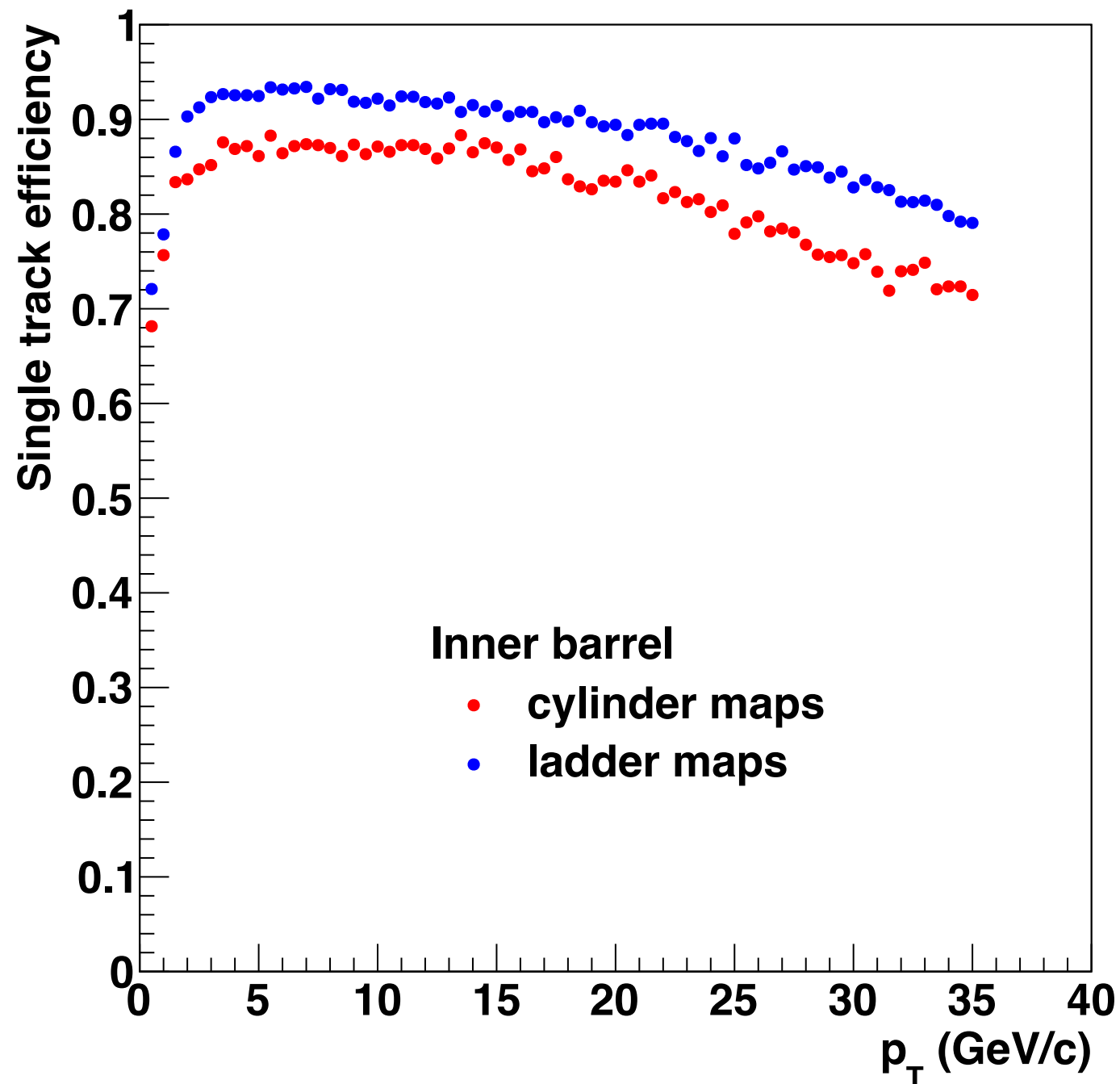
p_T resolution

Embedded 80 pions per central Hijing collision.



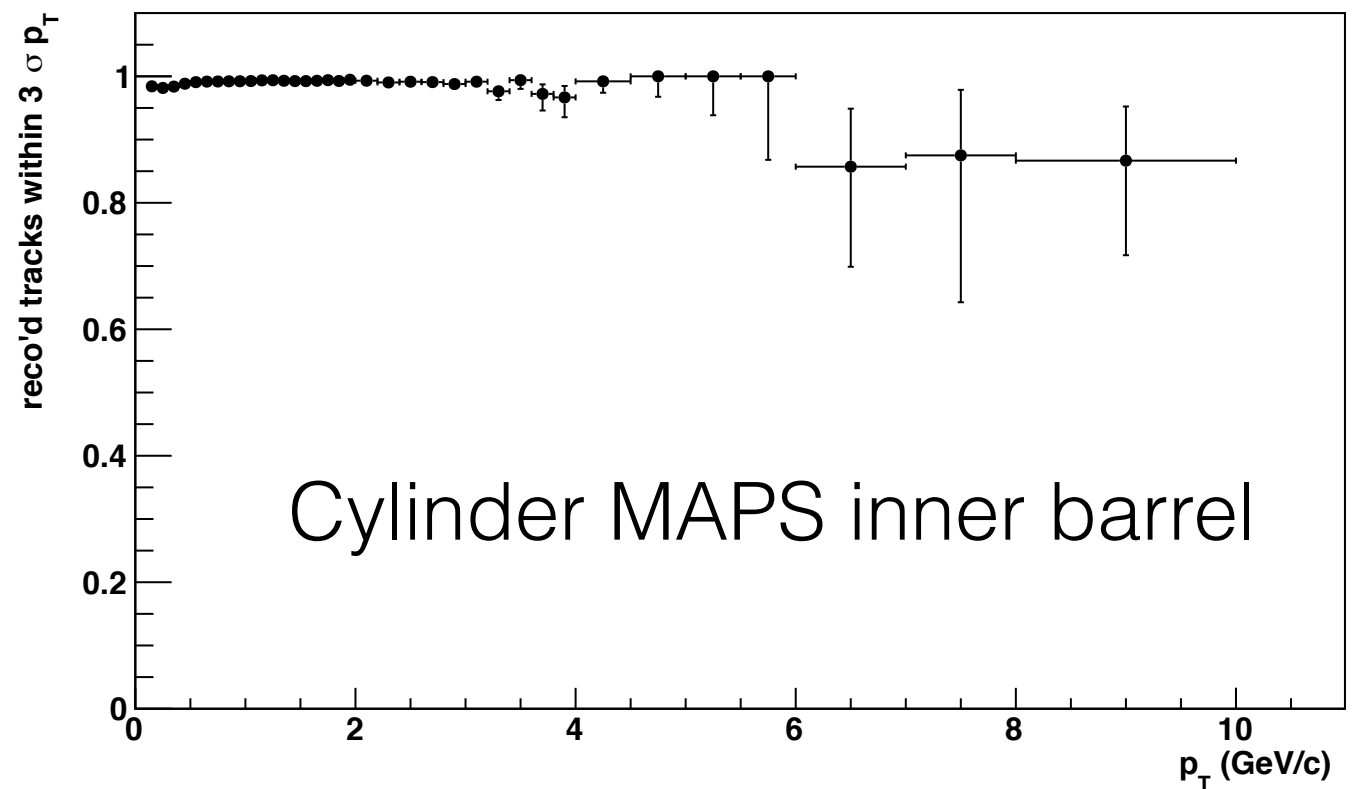
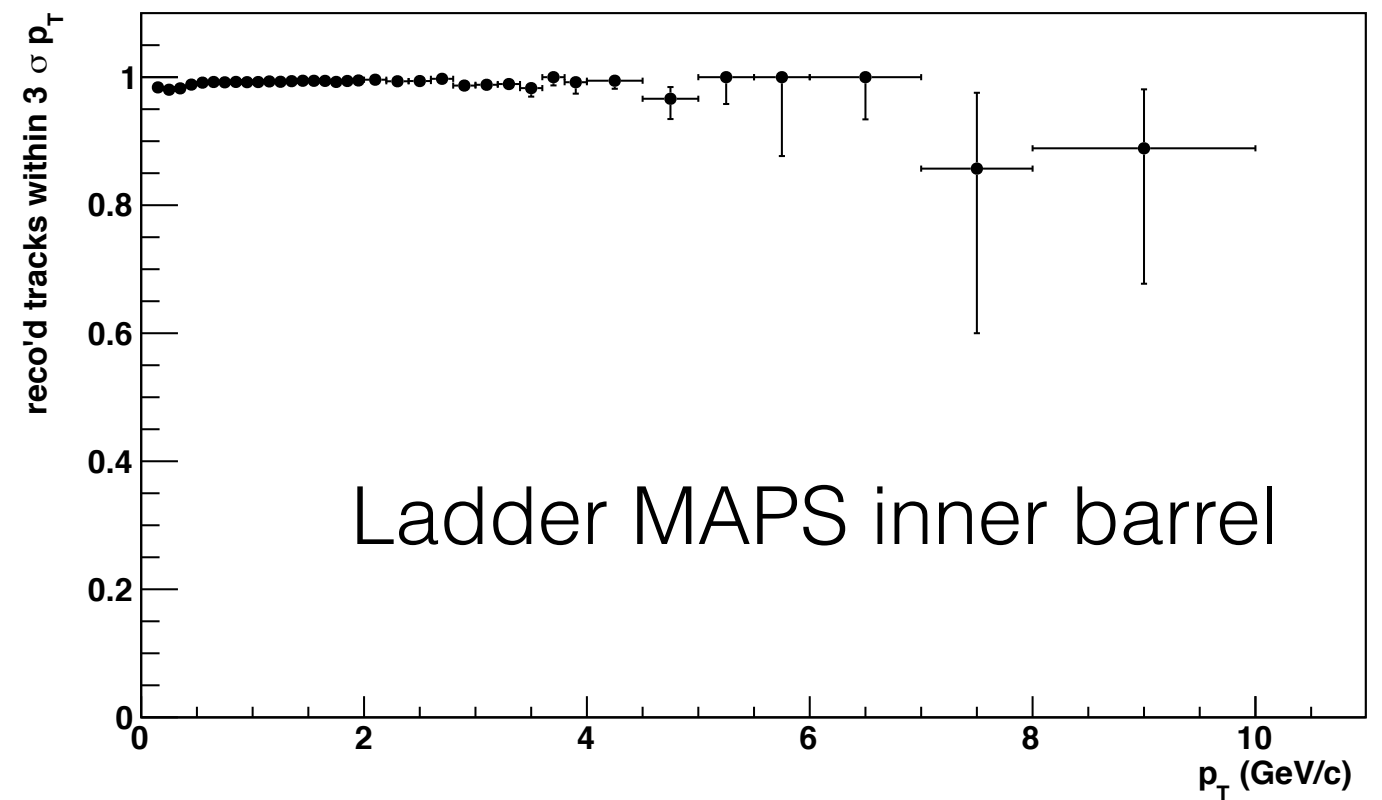
Single track efficiency

Embedded 80 pions per central Hijing collision.



Reco'd tracks within 3σ of truth p_T

Hijing tracks only.



Conclusions

The [dca2d](#) and p_T resolution performance with the default (github master) tracking code and default tune is slightly worse for ladders than for the cylinder model. The differences may be due to:

- Uneven mass distribution in the ladder case.
- Use of existing tracking code for the ladders that can use only 1 hit per layer.

The single track efficiency is slightly better for the ladders. This is expected:

- In the cylinder cell model the cell and (particularly) cluster thresholds are set high enough to cause a small loss of efficiency in the silicon.
- They were reduced for the ladder case and the efficiency increased.

The fraction of reconstructed tracks falling within 3σ of the truth p_T is essentially 100% in both ladder and cylinder MAPS cases.